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THE TYPHOID CONTROL PROGRAM AND RESULTS OF 13 YEARS' WORK IN WILLIAMSON COUNTY, TENNESSEE, 1922-35¹

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In spite of active control measures, typhoid fever still remains a rural problem of public health importance, particularly in the Southern States. Although the mode of spread of typhoid has been known for many years, comparatively little has been done toward thorough investigation and control of endemic cases that so frequently occur in rural sections. Immunization and sanitation campaigns by State and local health agencies have resulted in a marked reduction in the number of typhoid cases; yet there are comparatively few accurate data available showing the relative value of the several measures employed in a rural typhoid-control program. As a consequence, it was felt that an analysis of the Williamson County program which has been conducted over a 13-year period might afford an excellent opportunity to appraise the value of, first, immunization and case control, and, second, immunization and case control plus a general sanitation and educational program. During the latter part of the program (1930-35), some consideration was given investigation to determine the actual source of case infection and toward more adequate case control measures, the efforts and activities of the entire county health department personnel being routinely utilized in some phase of this study, which was made possible through a supplementary grant by the Rockefeller Foundation and advisory assistance by Dr. George H. Ramsey, of Johns Hopkins School of Hygiene and Public Health.

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GENERAL CONSIDERATIONS

Williamson County is not unlike the average rural county of Tennessee. The population of 22,845 is composed of 77 percent white and 23 percent Negro. Approximately 14 percent of the total population is classified as urban and lives in Franklin, the county seat and only incorporated town of the area. The residential and racial classifications varied but little during the period. Agriculture is the chief means of livelihood, with dairying being a year-round source of income. The three small industrial plants in the county employ less than 300 persons, and there are no industrial communities. The general economic status of the area should probably be classed as above-average when compared with the rural South as a whole.

There had been no outbreak of communicable disease in the county during recent years that would likely be confused with typhoid fever, the diseases reported varying very little from the morbidity reports from other sections of the State. Malaria was not a problem, although during recent years there has been an increasing number of cases of apparent extracounty origin. Diarrheas and other enteric conditions were prevalent largely during the warmer months, but were of no unusual incidence or severity. Endemic typhus, Rocky Mountain spotted fever (eastern type), undulant fever, and tularaemia were reported and diagnoses confirmed between 1928 and 1935. The average annual tuberculosis death rate during the past 5-year period was slightly in excess of 100 per 100,000 population; two reported typhoid suspects occurring since 1928, both of which terminated fatally, were confirmed cases of acute miliary tuberculosis. Thus, it is evident that the available diagnostic facilities were reasonably adequate and efficient.

A full-time health department was organized in October 1921 and has functioned continuously since that date. The initial personnel consisted of a health officer, nurse, and clerk. A sanitation officer was added in 1923, an additional nurse in 1928, and an assistant health officer and two additional nurses in 1930, the latter group being added directly as a result of special Rockefeller Foundation grant and an increased local appropriation in order that the area might be used for epidemiological research and the training of field personnel.

The purpose and plan of the study as originally begun were as follows:

- (1) Determination of the actual prevalence, past and current, of typhoid fever in Williamson County, a rural Tennessee county, and a comparison with adjacent counties, both with and without full-time health service.

(2) Investigation and development of methods for the administrative management of cases and carriers, as well as a means for the control and elimination of other infective foci.

(3) Investigation of the relative value of (a) the case-handling procedure, (b) the immunization program, (c) the general sanitation program, and (d) carrier-control measures.

Unusual research opportunities are ever present in county health department field activities, and it was felt that a part of the effort expended in these activities could be and should be devoted to the systematic and cumulative collection of valuable data without materially interfering with the general program. This apparent fact does not seem to be recognized by the average county health officer, even though such a practice does much toward eliminating the monotony of a routine field program and offers an excellent opportunity for ambitious individuals to develop personnel initiative and coordination of interdepartmental effort. Any procedure undertaken should be under the direct supervision of the department director, but not necessarily restricted to the efforts of that individual or any particular member of the department staff. As in this study, every member of the staff from clerk to director can make a valuable contribution in one way or another without interfering in the least with the regular routine program.

GENERAL FINDINGS

PREVALENCE OF TYPHOID FEVER, 1916-35

Available reports clearly indicate that typhoid fever appeared as a serious endemic disease that had assumed epidemic proportions at times in the past.

Table 1 was prepared from official State and local records.

TABLE 1.—*Reported cases and deaths and case and death rates from typhoid fever, Williamson County, Tenn., Jan. 1, 1916-Oct. 1, 1935*

Year	Cases	Case rate ¹	Deaths	Death rate ¹
1916-21.....	2 61.7	262.9	2 6.8	29.1
1922.....	59	253.3	3	12.9
1923.....	34	146.3	0	0
1924.....	10	43.1	2	8.6
1925.....	31	134.0	2	8.6
1926.....	34	147.4	2	8.6
1927.....	14	60.8	2	8.7
1928.....	19	82.9	2	8.7
1929.....	13	56.6	1	4.3
1930.....	9	39.4	1	4.3
1931.....	3	13.1	0	0
1932.....	7	30.5	0	0
1933.....	3	13.1	0	0
1934.....	1	4.4	0	0
1935.....	1	4.4	0	0

¹ Per 100,000 population.

² Mean annual number.

Table 1 indicates that, while the occurrence of cases has been somewhat irregular, there has been a marked decline in both morbidity and mortality from typhoid fever during recent years. The decline apparently began soon after the establishment of full-time health service and appears to be more pronounced during the two periods 1923-28 and 1929-35. There is no reason to believe there had been any change in the causative organism. The change of population characteristics as to color and residence was relatively insignificant; and unless the decline was a part of a general State-wide decline in typhoid morbidity and mortality, presumably it must have been related in

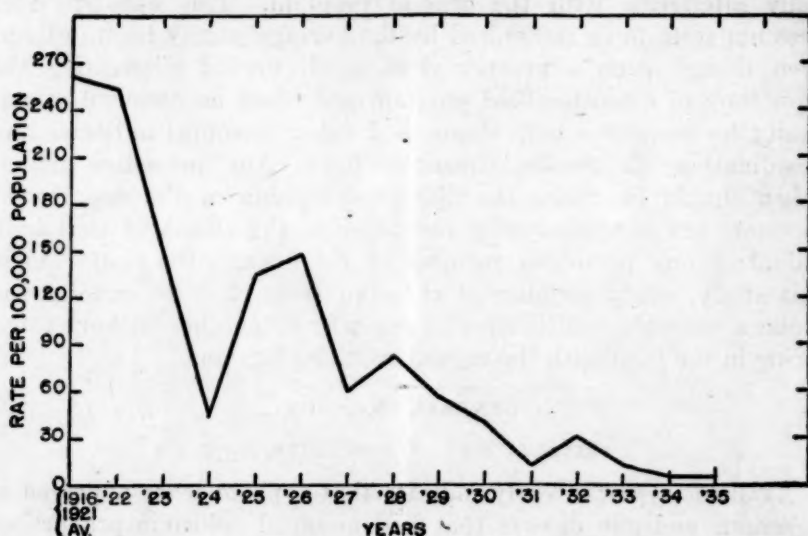


FIGURE 1.—Typhoid fever case rates, Williamson County, Tenn., Jan. 1, 1916-Oct. 1, 1935.

some way to the activities of the county health department or other agencies within the area.

It is also observed that the reporting of cases during recent years, certainly since 1928, has been relatively complete, because of the increased interest of private physicians as a result of an improved diagnostic procedure; also because of increased field activity by the health department. An attempt will be made to correlate these observations with certain phases of the program to be described in a subsequent section of this article.

CASE-HANDLING PROCEDURE

The department files contained only 32 case records for the 67 cases reported during the years 1926-28, inclusive. The available records were rather incomplete and gave no leads regarding the possible source of infection except where there was a known history of direct contact.

Hence, had the other records been available, in all probability they would have been valueless. No carriers were recorded or listed as having been under supervision prior to 1930. The routine case service prior to 1928 usually consisted of an initial visit by the health officer for diagnosis and general instructions regarding concurrent disinfection with the number of subsequent visits being largely determined by the case or community problem, also, by the exigencies of the general program.

Beginning in 1928, the nursing service was given some case-handling responsibility—an effort was made to have cases visited once each week with a careful check being made on means of concur-

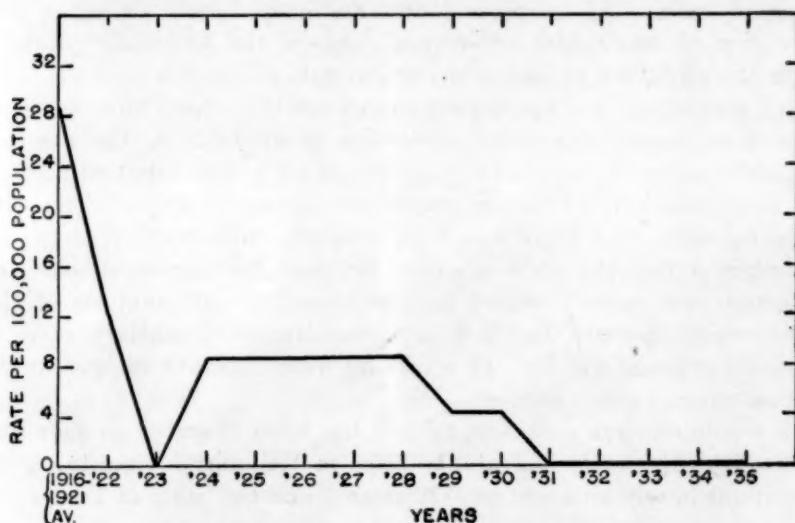


FIGURE 2.—Typhoid fever death rates, Williamson County, Tenn., Jan. 1, 1916–Oct. 1, 1935.

rent disinfection, care of patient, also demonstrations and other services performed as indicated.

In 1930 the sanitation inspector was assigned the responsibility of getting an approved excreta-disposal system and water-supply system installed in the home immediately after a case or suspected case of typhoid fever was reported.

The routine case-handling procedure since July 1930 has been as follows:

- (1) After a case has been reported, immediate visit for diagnosis by the health officer, giving general instructions and starting routine epidemiological study, which includes complete case history and outline of investigative procedure, the investigation to include routine collection of urine and feces specimens on all household and suspicious contacts.

(2) Case visited within 24 hours by nurse, who gives more specific instructions and demonstrates bedside nursing care and concurrent disinfection. The nurse also begins the organization of the immunization clinic to be conducted by the health officer. Nursing visits are routinely made each week until convalescence.

(3) The sanitation officer usually starts efforts toward improved sanitation within 48 hours after the case is reported (the health officer having previously advised the family that both the nurse and sanitation officer would visit them in the interest of their respective types of service).

(4) All personnel make routine community inquiry for suspected typhoid cases. All suspects found are immediately called to the attention of the health officer, who makes the necessary contacts with the physician in charge or investigates as needed.

An analysis of the annual reports shows that there have been no known or suspected typhoid epidemics attributable to the town of Franklin water supply (the city survey of 1927 shows that 83 percent of the population of Franklin used the city water supply). The 1926 report reveals that there was a questionable milk-borne epidemic in Franklin during the early summer, but that the suspected source of infection was never verified bacteriologically. An analysis of the case records reveals that lack of immunization, insanitary excreta-disposal system, and lack of screening were constant findings in all homes where cases occurred.

For comparative purposes, table 2 has been prepared to show the mortality rates and case-fatality rates in Williamson County, counties immediately adjacent to Williamson, and the State of Tennessee.

TABLE 2.—Mean annual mortality rates and case-fatality percentages for typhoid fever, Williamson County, counties adjacent to Williamson, and the State of Tennessee, by 5-year periods, 1916-34, inclusive

County	Mean annual mortality rates per 100,000 population				Mean annual case-fatality percentages			
	1916-20	1921-25	1926-30	1931-34	1916-20	1921-25	1926-30	1931-34
Maury ¹	42.8	24.0	23.3	14.7	46.7	25.9	16.0	27.3
Hickman	22.1	29.7	24.1	17.1			20.5	41.2
Rutherford ²	24.8	24.4	24.0	13.4	(³)	85.3	23.2	19.7
Davidson ⁴	17.6	14.8	4.9	3.0	12.3	18.6	26.2	30.4
Cheatham	45.4	10.3	13.0	18.5	7.5	4.2	13.3	12.5
Dickson	17.5	24.1	23.6	5.4			22.9	10.3
Williamson ⁵	24.6	16.4	6.9	0.0	10.6	8.3	9.1	0.0
Tennessee	29.2	23.5	16.6	10.3	31.9	35.0	17.6	15.9

¹ Health service organized 1931.

² Health service organized 1924.

³ Statistics not accurate.

⁴ Health service organized 1920.

⁵ Health service organized 1921.

An analysis of the case fatality rates seems to indicate better and more uniform reporting in Williamson County than in the surrounding areas; and based on that deduction, it is seemingly apparent that

more consistent reduction in typhoid mortality has occurred in Williamson County than in neighboring counties and in the State as a whole. It seems logical to assume that this consistent decrease in mortality perhaps was not due to lessened virulence of the organism or to other more or less general causes.

Table 3 shows the distribution of deaths, urban and rural, with rates for each group.

TABLE 3.—*Typhoid fever mortality rates, urban ¹ and rural classification, per 100,000 population, Williamson County, Tenn., 1916-35*

Period	Rural		Urban ¹	
	Recorded deaths	Mean annual death rate	Recorded deaths	Mean annual death rate
1916-20.....	21	21.8	8	38.3
1921-25.....	15	15.8	4	18.6
1926-30.....	8	8.7	1	4.6
1931-35.....	0	0	0	0

¹ Includes town of Franklin and Ninth Civil District, which is immediately adjacent thereto

Similarly, as in reports of other prevalence studies in the smaller municipalities, the morbidity and mortality rates have shown the

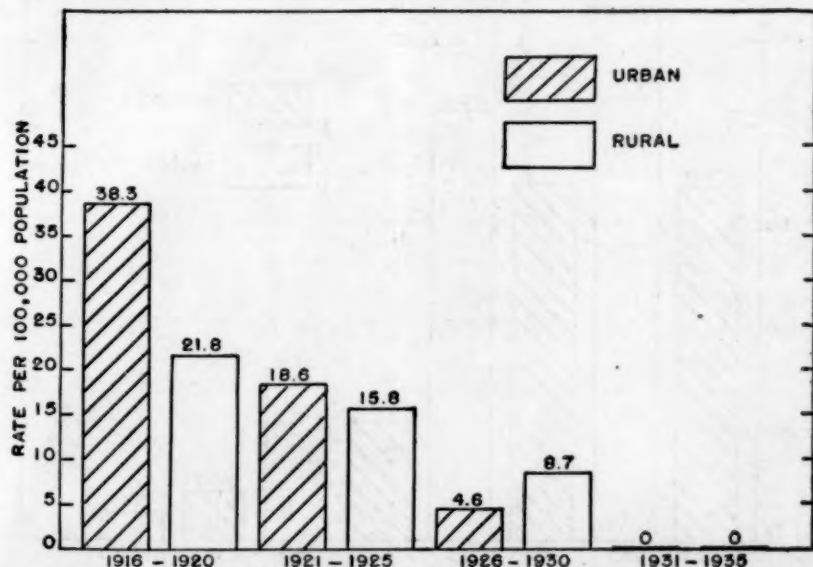


FIGURE 3.—Mean annual typhoid fever mortality rates (5-year grouping), urban and rural populations, Williamson County, Tenn., 1916-1935, inclusive.

greatest decline in Franklin, the only urban area of the region. The unsewered section of Franklin had a relatively large number of sanitary privies installed in 1926, and an intensive sanitation cam-

paign was waged in 1928, when more than 90 percent of the unsewered homes had an approved means of excreta disposal installed. During this period many surface wells were condemned and many connections made to the city water supply. The rural sanitation work was not started until about the middle of 1928.

Table 4 compares case and death rates in the white and Negro groups.

TABLE 4.—Mean annual morbidity and mortality rates, white and Negro, per 100,000 population, Williamson County, Tenn., 1916-35

Period	Mean annual case rate		Mean annual death rate	
	White	Negro	White	Negro
1916-20.....	257.8	171.0	22.7	29.5
1921-25.....	207.3	171.9	12.9	25.6
1926-30.....	82.6	57.9	5.7	10.8
1931-35.....	13.1	23.7	0	0

Table 4 indicates that the greatest decline in case and death rates in the Negro group occurred during the 1926-30 period, which included the two clean-up campaigns in Franklin and thickly populated

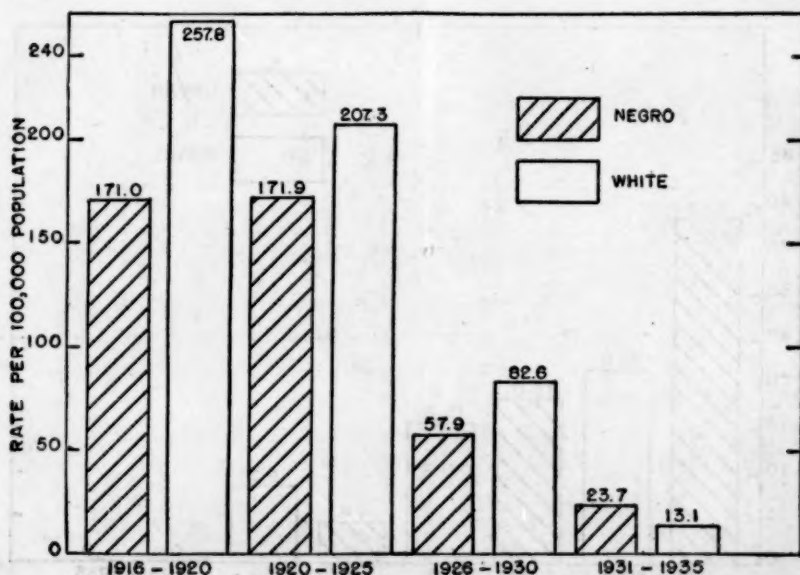


FIGURE 4.—Mean annual typhoid fever morbidity rates (5-year grouping), white and Negro populations, Williamson County, Tenn., 1916-1935, inclusive.

communities; an intensive inoculation campaign was also conducted among the Negro group during this period. The greatest decline in the white group occurred during the past 4-year period, when the county-wide sanitation program reached the rural area.

TYPHOID IMMUNIZATION

Shortly after the establishment of the health department in 1921, and before any immunization clinics were organized, the Williamson County Medical Society approved the organization and conduct of these clinics throughout the entire county. As a general rule, clinics were held in all schools of the county during the school year, by the health department, with additional clinics being held during the summer months at the various country stores and community centers. All persons desiring the immunization were advised that it should

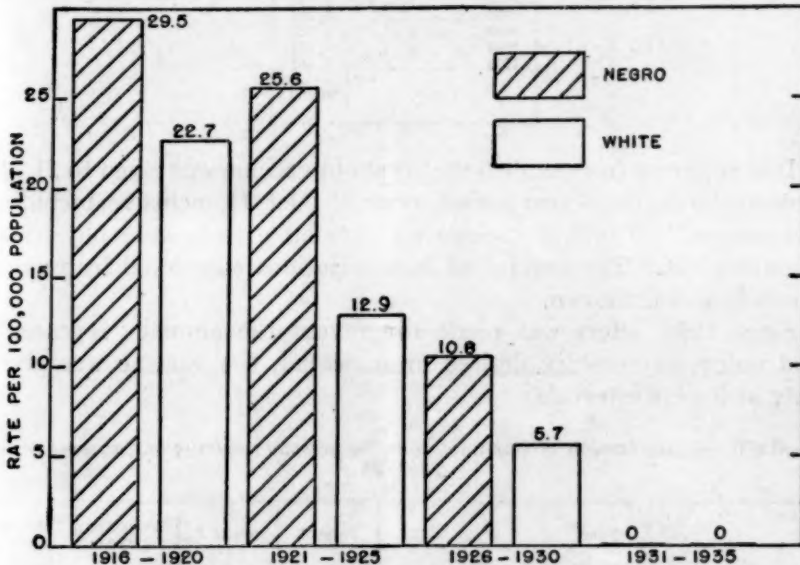


FIGURE 5.—Mean annual typhoid fever mortality rates (5-year grouping), white and Negro populations, Williamson County, Tenn., 1916-1935, inclusive.

be repeated at least every third year and more often in the presence of a case in the home or an increasing number of cases in the community. Immunization clinics were routinely organized as a part of the case-handling procedure.

The vaccine used was prepared from Rawling's strain of *B. typhosus*, Owens' strain of *B. para typhosus* A, and Schottmüller or Kessle's strain of *B. para typhosus* B.

An effort was made to reach the population between 3 and 40 years of age, with vaccine being given the group under 3 years only in the presence of a case in the family.

The number of typhoid immunizations (3-dose) completed by the health department staff by calendar years from 1921 to September 30, 1935, inclusive, is shown in table 5.

TABLE 5.—*Immunizations completed, 1921-35, inclusive*

Year	Completed immunizations
1921.....	4
1922.....	2,265
1923.....	1,194
1924.....	1,852
1925.....	1,936
1926.....	1,962
1927.....	3,081
1928.....	2,197
1929.....	3,759
1930.....	3,534
1931.....	3,551
1932.....	3,918
1933.....	3,921
1934.....	3,261
1935.....	3,557
Total.....	39,992

It is apparent from table 5 that typhoid vaccine was given to 21,742 persons during the 6-year period, 1930-35 (Oct. 1), inclusive, including "repeaters." Typhoid vaccine was available to private physicians upon request. The number of immunizations completed by private physicians is unknown.

Since 1929, effort was made to prevent the annual "repeater"; and unless expressly desired or indicated, the vaccine was given only at 3-year intervals.

TABLE 6.—*Classification of immunizations by persons receiving one or more series 1927-33*

Year	Series 1	Series 2	Series 3 or more	Total, all series
1927.....	2,507	0	0	2,507
1928.....	1,931	216	0	2,147
1929.....	2,773	469	38	3,280
1930.....	2,111	757	213	3,081
1931.....	2,069	1,001	536	3,606
1932.....	1,640	1,106	382	3,128
1933.....	1,896	1,202	310	3,408
Total.....	14,927	4,751	1,479	21,157

A check of the individual record cards of the 23,961 inoculations completed during the period 1927-33, inclusive, revealed 21,157 individual cards that could be tabulated. Table 6 shows that at least 10,489 different persons, or approximately 46 percent of the total county population, completed at least one series of typhoid prophylaxis during the 5-year period, 1929-33. Of this group, 8,914 were between 5 and 40 years of age. The United States Census Bureau figures of 1930 show that 61 percent of the total county population, or 13,935 persons, were classed in this age group; hence, approximately 64 percent of the so-called "typhoid age group" received prophylactic immunization during the period. It is of some interest to observe

that in the first civil district, which contains approximately 10 percent of the total county population, and in which the individual immunization file shows that 87.4 percent of the total population had received at least one series of typhoid vaccine during the period 1927-31, inclusive, typhoid fever had been practically eliminated without control measures other than the routine case handling, no general sanitation program having been carried on in this area during the above-mentioned period, excepting that incidental to the case-control policies.

Although 41.5 percent of the total population of civil districts 18 and 20 had received at least one series of typhoid vaccine, an average of 6 to 8 cases of typhoid fever occurred each year, with no appreciable decline in the morbidity rate until in 1929, at which time the two rural villages in this area were cleaned up. Following the sanitation program, in which approximately 85 percent of the homes had an approved means of excreta disposal installed, typhoid fever practically disappeared. Only 2 cases have been reported in these districts since June 1929, 1 being in a nonresident laborer, the other in a native of the larger unincorporated village.

TYPHOID FEVER IN VACCINATED INDIVIDUALS

In analyzing the 85 cases reported from 26 counties as occurring in individuals who had previously received one or more complete typhoid immunization series within 36 months prior to onset of illness, it was found that 72 of these had received one complete series (3-dose); 12, two series; and 1, three series. There were also reported 19 cases in persons who had an incomplete immunization series for the corresponding period. Among this group of 85 cases in individuals who had received one or more series there were 6 deaths, or a case fatality rate of 7 percent. Complete records from five representative counties of the group for the corresponding years in which cases were reported in the immunized group show there were 106 cases in the nonimmunized group, with 15 deaths, or a case-fatality rate of 14.2 percent.

GENERAL SANITATION

In reporting premises made sanitary, it is usually implied that a safe water supply as well as an improved excreta-disposal system has been provided, this being the rule with reference to urban homes; but in the rural home the condition of the water supply remained unchanged in most instances. An analysis of the department records shows that the following number of rural and urban homes had an approved means of excreta disposal installed between January 1, 1927, and September 30, 1935:

TABLE 7.—*Approved excreta disposal facilities installed, urban and rural, in Williamson County, 1927-35,¹ inclusive*

Year	Urban	Rural
1927.....	93	24
1928.....	94	340
1929.....	79	765
1930.....	72	597
1931.....	13	355
1932.....	5	95
1933.....	0	129
1934.....	48	319
1935.....	0	298
Total.....	404	2,922

¹Through September 1935.

The urban premises shown in table 7 include those in which major repairs had to be made or an approved type of privy installed, as the greater part of the urban sanitation work had been done prior to 1927. The 1927 survey of the town of Franklin showed that 55 percent of the homes were connected with city sewer, septic tank, or cesspool, the remaining 45 percent having what was once an approved type of privy or the usual insanitary privy. The survey also shows that 82.5 percent of the homes were connected with the city water supply system, with the other 17.5 percent receiving their water from wells, cisterns, or springs. With reference to rural sanitation work, very little had been done prior to 1928; and as there was no established maintenance program, it is reasonable to assume that the percentage of rural population served by improved excreta-disposal systems was relatively small. According to the 1930 census, there were approximately 4,000 rural homes in the county. Hence, from the above table, it is evident that 73.0 percent of the rural homes had an approved excreta-disposal system installed between January 1927 and October 1935. The greater portion of this work came after February 1928, when county-wide regulations governing excreta disposal were adopted. In the beginning of the general sanitation program, effort was first directed toward cleaning up the urban, suburban, and thickly populated community centers where typhoid fever had been prevalent in the past.

The general sanitation program was one of education rather than one of law enforcement. The first privy to be installed in a given community was usually in the school, in order that all persons interested might have an opportunity to see a life-sized model. That the program of demonstration, education, and persuasion has been successful is shown by the finding of a relatively large number of approved-type privies (for which the department has no record) during the CWA-ERA sanitation program of 1934 and 1935. An analysis of the table also shows that a relatively large amount of

construction was carried on during the depression years, 1930 and 1931. In only three instances was it found necessary to institute legal measures to get the sanitation regulations complied with, this action being taken as a last resort to get compliance with the regulations; also some consideration was given its general effect on the community in which the offender resided.

MILK SANITATION

The passage of the Standard Milk Ordinance by the City Council of Franklin in 1928 decreased the number of dairies selling raw milk in Franklin from 14 to 9; and since that date the number has been reduced to 7. There is no pasteurization plant in the area. Sanitary conditions found during the survey which was made prior to the passage of the ordinance were not unlike those one would expect to find in the voluntarily improved dairy. It is interesting to note that, in the examination of milk handlers, two typhoid carriers were found, one being employed in the dairy suspected during the milk typhoid epidemic of 1926. Many of the so-called "family cow" dairymen were eliminated by the ruling that any person delivering milk was operating a dairy, hence ordinance requirements were to be complied with. It must be admitted that some milk is still being delivered over the backyard fence, but the amount is much less than formerly.

Since 1929, milk samples for bacteriological analysis have been collected at random intervals each month and sanitary inspections made at intervals of 1 to 3 weeks, depending upon the conditions in the individual dairies. Degrading, after due notice of violation of sanitation items had been called to the dairyman's attention, seldom had to be repeated.

Because of the rural character of the area, there was no evidence to indicate such potential vectors as shellfish, ice cream, and green vegetables as important sources of typhoid fever in the county.

HEALTH EDUCATION

In addition to the information and instructions given with reference to case handling and protective measures, seasonal articles dealing with the value of and necessity for the various typhoid-control measures were prepared for the local newspapers. Also seasonal talks, in which the value of immunization and sanitation as typhoid-control measures were outlined, were made before the various community groups and civic organizations, always stressing that immunization was a more or less temporary means of protection whereas sanitation was the one single method for permanent control.

SUMMARY

1. The study was undertaken as part of a routine program of the county health department, with all staff members making a contribution.

2. The first period of decline (1921-25, inclusive) was associated with a generalized and intensive immunization program and an urban sanitation program in the unsewered section of the town of Franklin. There was a reduction of 51.7 percent and 27.5 percent in the urban and rural typhoid fever mortality rates, respectively.

3. The second period of mortality decline (1926-30, inclusive) was associated with a continuation of the immunization and urban sanitation programs and an extension of the sanitation program to suburban Franklin and the more thickly populated community centers throughout the county. This period showed a 75.3-percent decline in the urban and a 44.9-percent decline in the rural rates as compared with those of the preceding period. Compared with the rates of the 5-year period prior to the establishment of the health department, there was a decline of 88 percent for the urban areas and 70 percent for the rural sections.

4. During the last period, 1931-35, during which time the special study was carried on, the cumulative effects of all measures were apparent, since there was no death in either the rural or urban population.

5. The reduction in morbidity and mortality rates was proportionately greater in the white than in the Negro population, and the Negro group showed a higher case fatality rate during the entire period, excepting the latter years (1931-35), in which there were no deaths in either group. The morbidity decrease in the white group was greatest in the period during and immediately following the intensive rural sanitation program.

6. A complete analysis of the immunization status of the population of two civil districts, which constituted 10 percent of the total county population, shows that typhoid fever had practically disappeared during the 5-year period (1927-31), in which 87.4 percent of the total population received at least one series of typhoid vaccine. There was little or no decline in the morbidity rate in another area of similar size in which 41.5 percent of the total population had received at least one series of typhoid vaccine subsequent to June 1929, at which time the sanitation program was completed. Since that date only 2 typhoid fever cases have been reported from this area.

7. A State-wide analysis of the records of typhoid fever in vaccinated individuals shows a case fatality of 7 percent, and in non-vaccinated individuals of 14.2 percent, the vaccinated group having received a complete immunization series within 36 months prior to onset of illness.

8. The passage of the Standard Milk Ordinance and the finding of two typhoid carriers among dairy employees apparently confirmed the suspected source of a mild epidemic (1926) and may have been a contributing factor in the decreased urban rate.

9. The study findings clearly demonstrate the value of and need for accurate case investigation and the recording of all epidemiological information on the individual case record; also, that such a study can be carried on as part of the routine program of the average health department without materially interfering with the general program.

10. An analysis of the 13-year program reveals three successive and distinct periods in which there was a marked reduction in the typhoid morbidity and mortality rates in Williamson County. Since the reduction was proportionately greater than the reduction for surrounding areas without full-time health service and for the State at large, and since it coincided rather closely with the periods in which active and more efficient control measures were instituted and carried on, it logically follows that these measures in all probability were responsible for the declines noted.

CITY SMOKE AND ITS EFFECTS

The following statement¹ was recently prepared by the United States Public Health Service for the hearing on the bills for smoke control in the District of Columbia before the Congressional Subcommittee on Public Health, Hospitals, and Charities and has been printed in the report of the hearings. It is reprinted here on account of the interest manifested at the present time in smoke control and smoke prevention.

The losses due to smoke may be classified as follows: Economic losses due to imperfect combustion of fuels; extra expense of cleaning clothes; losses due to disfigurement of residences, office buildings, and factories (repainting, etc.); losses due to soiled merchandise in stores; injuries to grass, shrubs, and trees bordering the streets and in the parks; loss of daylight and ultraviolet light; possible injurious effects on health.

Many estimates have been made of the losses due to these various causes, but the most thorough and consistent are those made by the Mellon Institute of Pittsburgh in 1913.

It was estimated that by the proper stoking of furnaces 21.7 percent of the fuel could be saved,² and that the loss due to imperfect combustion in Pittsburgh at that time was \$1,520,000 during the year, or a loss for each man, woman, and child, due to incomplete combustion, of about \$2.80 per year.

¹ By James E. Ives, senior physicist, and R. R. Sayers, senior surgeon, U. S. Public Health Service.

² O'Connor: Mellon Institute, Smoke Investigation Bulletin No. 4.

O'Connor also estimated that the extra expense, due to smoke, of cleaning clothes, laundry, and dry-cleaning bills in Pittsburgh in 1913 was about \$2,250,000, or \$4.10 a person.

The estimated expense attributed to the necessity for repairing residences because of soiling by smoke, such as repainting, repapering, and replacing hangings, was \$1,240,000, or \$2.26 per person per year.

O'Connor reported that, in Pittsburgh in 1913, the estimated loss due to merchandise in the stores being soiled or ruined by smoke was \$1,650,000, or a loss of \$3 per person per year.

A smoky atmosphere also means loss of daylight and increased lighting bills.

The sum of the losses from the four sources mentioned is \$12.16 per person per year. O'Connor estimated that the total loss due to smoke in Pittsburgh during the year 1913 was \$10,000,000, or \$20 for every man, woman, and child. In surveys made in New York, Chicago, Salt Lake City, Boston, and Baltimore, the economic loss has been estimated at from \$10 to more than \$30 per person per year.

Besides these losses, which affect the pocketbook directly, the literature on the subject discusses the injury of smoke to plants, shrubs, and trees along the streets and in the parks. The deposit of soot on the leaves of plants interferes with their growth, plugging up the stomata, or minute pores of the leaves, by means of which they absorb the carbon dioxide from the air, upon which they feed, converting it into sugars, starches, and carbohydrates. The soot also coats the leaves and reduces the amount of sunlight reaching them, and in this manner slows down the rate of growth of the plant. Plants cannot grow without sunlight. Experiments carried on at Leeds, England, have shown a direct effect of smoke upon the growth of plants, the growth of lettuce, for instance, in a very smoky district being only one-fourth of that in a clear district.³

One of the effects of a smoky atmosphere is the loss of daylight and of ultraviolet light due to the smoke. Smoke in the atmosphere absorbs the ultraviolet light coming from the sun and the sky. Various investigators have shown that both daylight and ultraviolet light are absorbed by smoke. The health department of the city of Baltimore found from 1926 to 1928 that the amount of ultraviolet light was 50 percent greater in the country than in the city, due to the absence of smoke.⁴ The department of health in Chicago found losses of from 51 to 43 percent of the ultraviolet light in Chicago on smoky days.⁵ During the Mellon Institute survey, H. H. Kimball found the ultraviolet light to be 60 percent less in Pittsburgh than in Sewickley, a small residential town 12

³ Cohen and Ruston: *Smoke, A Study of Town Air*, pp. 23-33.

⁴ Shrader, Coblenz, and Korff: *Am. Jour. Pub. Health*, July 1929.

⁵ Tonney, Heft, and Sommers: *Jour. Prev. Med.*, March 1930.

miles to the northwest of Pittsburgh.⁶ The United States Public Health Service found in New York in 1927 an average loss throughout the year of 21.5 percent of the daylight, due to smoke. On some days the loss was greater than 50 percent. In Baltimore the United States Public Health Service investigators found the average loss of daylight during the year 1929-30 to be 14.1 percent. On some days the loss was greater than 50 percent.⁷

The United States Public Health Service found during the years 1932 to 1933 that smoke and dust were deposited at the rate of 296 tons per square mile per year in Washington at Seventh and B Streets SW., of which 154 tons were carbon and 142 tons were ash. Some figures on the amount of dust deposited per square mile per year in some other American cities and in some foreign cities are given in the accompanying tables.

⁶ H. H. Kimball: Mellon Institute, Smoke Investigation Bulletin No. 5.

⁷ Pub. Health Bull. No. 197 and Pub. Health Rep., Feb. 3, 1933.

TABLE 1.—*Settled dust and sulphur dioxide in American cities*

City	Investigator	Location	Year	Season of year	Average number of tons of dust deposited per square mile per year					Sulphur dioxide, Parts in a million of air	
					Total	Carbon	Ash	Tar	Iron oxide Fe ₂ O ₃	Range	Average
Pittsburgh, Pa.	Mellon Institute.	Whole city.	1912-13	Whole year	1,031	317	714	10.1	261	1.1	0.14
Salt Lake City, Utah.	Bureau of Mines.	do.	1919-20	1922	1,250	95	155	155		.0	0.036
Graton, W. Va.	do.	do.	1922	1927-29	1,876	871	1,005				
Cleveland, Ohio.	Cleveland Health Council.	Whole city.	1927-29	Whole year	1,780	228	832		120		
Baltimore, Md.	Baltimore Health Department.	Center of city.	1928-29	Whole year	1,800	960	810	8.7			
Washington, D. C.	Public Health Service.	7th & B Sts.; SW.	1932-33	Whole year	1,506	184	142		15		

1 During a fog.

TABLE 2.—*Settled dust per square mile per year in foreign cities*

City	Authority	Year	Tons per square mile per year		City	Authority	Year	Tons per square mile per year	
			58-428	25-539				1928-29	240
London, England.	Bureau of Mines.	1910			Manchester, England.	Bureau of Mines.			345-690
Leeds, England.	do.	1910-11			Hamburg, Germany.	do.			278
Glasgow, Scotland.	do.				Osaka, Japan.	Fujiwara.			

DEATHS DURING WEEK ENDED DEC. 14, 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Dec. 14, 1935	Correspond- ing week, 1934
Data from 86 large cities of the United States:		
Total deaths.....	8,712	8,429
Deaths per 1,000 population, annual basis.....	12.1	11.7
Deaths under 1 year of age.....	563	569
Deaths under 1 year of age per 1,000 estimated live births.....	52	54
Deaths per 1,000 population, annual basis, first 50 weeks of year.....	11.3	11.3
Data from industrial insurance companies:		
Policies in force.....	67,807,743	67,072,330
Number of death claims.....	13,579	12,544
Death claims per 1,000 policies in force, annual rate.....	19.4	9.8
Death claims per 1,000 policies, first 50 weeks of year, annual rate.....	9.5	9.8

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291
292

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Dec. 21, 1935, and Dec. 22, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 21, 1935, and Dec. 22, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec. 21, 1935	Week ended Dec. 22, 1934	Week ended Dec. 21, 1935	Week ended Dec. 22, 1934	Week ended Dec. 21, 1935	Week ended Dec. 22, 1934	Week ended Dec. 21, 1935	Week ended Dec. 22, 1934
New England States:								
Maine.....	2		1	1	255	21	0	1
New Hampshire.....		1			24	36	0	0
Vermont.....		1			79	1		0
Massachusetts.....	10	11			195	151	4	3
Rhode Island.....		6			122	3	1	0
Connecticut.....	7	2	7	8	76	316	2	0
Middle Atlantic States:								
New York.....	45	57	113	165	570	634	12	5
New Jersey.....	14	16	10	322	20	36	1	0
Pennsylvania.....	55	72			127	888	3	3
East North Central States:								
Ohio.....	37	69	9	3	52	238	3	1
Indiana.....	56	39	25	50		148	1	0
Illinois.....	73	68	34	57	20	1,212	4	7
Michigan.....	19	8	6	6	27	111	4	1
Wisconsin.....	3	3	55	17	75	452	2	3
West North Central States:								
Minnesota.....	3	1			54	728	1	1
Iowa.....	34	6		7	5	541	0	2
Missouri.....	46	27	96	92	15	71	2	1
North Dakota.....	2	4	2	6	14	94	0	0
South Dakota.....	9	4	1		2	40	0	0
Nebraska.....	9	5			17	39	2	1
Kansas.....	13	12	4		7	350	3	2
South Atlantic States:								
Delaware.....	2			2	102	3	0	0
Maryland ¹	20	15	35	18	41	41	5	0
District of Columbia.....	16	10	1	9	1	1	1	0
Virginia.....	26	30			22	173	4	0
West Virginia.....	33	48	43	18	3	213	3	0
North Carolina ¹	36	36	21	49	7	407	1	1
South Carolina.....	2	6	250	738		9	0	0
Georgia ²	9	14	88				3	0
Florida ²	11	10	4	1	1	3	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 21, 1935, and Dec. 22, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec. 21, 1935	Week ended Dec. 22, 1934	Week ended Dec. 21, 1935	Week ended Dec. 22, 1934	Week ended Dec. 21, 1935	Week ended Dec. 22, 1934	Week ended Dec. 21, 1935	Week ended Dec. 22, 1934
East South Central States:								
Kentucky.....	23	30	37	34	32	116	2	3
Tennessee.....	39	37	40	64	2	12	5	1
Alabama ¹	14	20	156	264	6	70	2	1
Mississippi ¹	3	8					1	0
West South Central States:								
Arkansas.....	8	13	52	59	3	5	0	0
Louisiana ¹	21	34	21	6	22	17	1	2
Oklahoma ¹	22	15	80	190		1	8	0
Texas ¹	97	83	185	239	14	39	6	2
Mountain States:								
Montana.....	7	17	22		20	78	0	1
Idaho.....		1	2	6	11	5	0	0
Wyoming.....		1			2	4	0	0
Colorado.....	11	2			7	342	0	1
New Mexico.....	11	3	3	10	2	23	0	0
Arizona.....	5	2	47	20		63	0	1
Utah ¹				3		24	1	0
Pacific States:								
Washington.....	2				157	79	3	2
Oregon.....	9	2	23	54	323	23	1	0
California.....	33	22	40	20	302	46	6	1
Total.....	897	871	1,393	2,438	2,845	7,907	98	47
First 51 weeks of year.....	37,290	39,628	116,947	63,615	719,482	720,951	5,476	2,233

Division and State	Polliomylitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec. 21, 1935	Week ended Dec. 22, 1934	Week ended Dec. 21, 1935	Week ended Dec. 22, 1934	Week ended Dec. 21, 1935	Week ended Dec. 22, 1934	Week ended Dec. 21, 1935	Week ended Dec. 22, 1934
New England States:								
Maine.....	2	0	17	30	0	0	3	2
New Hampshire.....	0	0	7	29	0	0	1	0
Vermont.....	1	0	11	14	0	0	1	1
Massachusetts.....	6	0	250	148	0	0	0	3
Rhode Island.....	0	0	31	8	0	0	0	1
Connecticut.....	0	0	40	39	0	0	1	0
Middle Atlantic States:								
New York.....	8	2	590	433	0	0	4	7
New Jersey.....	1	0	138	123	0	0	1	1
Pennsylvania.....	2	2	393	469	0	0	5	8
East North Central States:								
Ohio.....	1	0	298	477	1	1	4	5
Indiana.....	0	4	263	181	6	1	3	3
Illinois.....	3	2	593	658	2	1	6	29
Michigan.....	1	2	296	288	0	0	4	7
Wisconsin.....	0	1	445	390	8	8	1	0
West North Central States:								
Minnesota.....	1	1	301	185	5	5	1	2
Iowa.....	4	0	184	44	19	0	1	4
Missouri.....	0	0	192	68	4	3	3	3
North Dakota.....	0	0	67	27	3	5	0	0
South Dakota.....	0	0	53	23	6	4	3	1
Nebraska.....	0	0	249	40	20	15	0	0
Kansas.....	2	1	125	90	12	1	1	1
South Atlantic States:								
Delaware.....	0	0	19	4	0	0	1	0
Maryland ¹	1	0	101	103	0	0	15	1
District of Columbia.....	0	0	10	29	0	0	0	0
Virginia.....	1	1	50	97	0	8	4	5
West Virginia.....	0	1	75	126	0	0	2	10
North Carolina ¹	3	1	83	75	0	0	4	5
South Carolina.....	1	0	6	5	0	0	1	1
Georgia ¹	0	0	20	11	0	0	3	5
Florida ¹	0	0	6	7	0	0	0	9

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 21, 1935, and Dec. 22, 1934—Continued

Division and State	Polio-myelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec. 21, 1935	Week ended Dec. 22, 1934	Week ended Dec. 21, 1935	Week ended Dec. 22, 1934	Week ended Dec. 21, 1935	Week ended Dec. 22, 1934	Week ended Dec. 21, 1935	Week ended Dec. 22, 1934
East South Central States:								
Kentucky.....	0	0	46	43	0	0	3	2
Tennessee.....	1	0	41	52	0	1	2	5
Alabama ¹	0	0	17	12	1	5	1	3
Mississippi ²	0	0	21	14	0	0	0	4
West South Central States:								
Arkansas.....	0	0	13	7	0	7	2	8
Louisiana ³	1	1	12	25	0	1	9	17
Oklahoma ⁴	0	0	36	25	0	1	8	7
Texas ⁵	0	0	75	69	0	3	16	44
Mountain States:								
Montana.....	0	1	90	33	34	0	2	2
Idaho.....	0	0	45	4	0	1	0	0
Wyoming.....	0	0	80	19	3	4	0	1
Colorado.....	0	0	170	151	5	2	2	2
New Mexico.....	1	0	64	24	0	1	10	13
Arizona.....	0	0	30	25	0	0	0	2
Utah ¹	0	0	72	55	0	0	0	3
Pacific States:								
Washington.....	0	6	73	54	25	41	2	3
Oregon.....	2	1	47	46	1	3	3	2
California.....	9	6	280	135	8	0	8	4
Total.....	52	33	6,084	5,014	163	122	141	236
First 51 weeks of year.....	10,693	7,230	246,192	209,515	7,297	5,029	17,342	20,845

¹ New York City only.

² Week ended earlier than Saturday.

³ Typhur fever, week ended Dec. 21, 1935, 29 cases, as follows: Maryland, 1; North Carolina, 1; Georgia,

13; Alabama, 3; Louisiana, 1; Texas, 10

⁴ Rocky Mountain spotted fever, week ended Dec. 21, 1935, North Carolina, 1 case.

⁵ Dengue, week ended Dec. 21, 1935, Florida, 1 case.

⁶ Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Menin- gococ- cus menin- gitis	Diph- theria	Influ- enza	Maln- ria	Mea- sles	Pel- lagra	Polio- mye- litis	Scarlet fever	Small- pox	Ty- phoid fever
<i>November 1935</i>										
Alabama.....	10	203	161	418	28	18	5	109	0	32
Idaho.....	1	3	20	—	56	—	1	297	1	12
Illinois.....	34	364	74	21	74	—	23	1,996	8	66
Kansas.....	6	71	45	—	29	—	2	560	42	21
Maryland.....	5	62	20	1	39	—	16	375	0	61
Minnesota.....	2	65	4	—	179	—	6	1,104	2	8
New York.....	30	132	—	8	1,776	—	97	1,697	0	47
North Dakota.....	—	7	21	—	51	—	2	194	9	3
Ohio.....	14	350	141	—	353	—	3	1,601	1	35
Pennsylvania.....	17	196	—	2	323	1	20	1,364	0	50
South Dakota.....	3	9	12	—	17	—	2	247	51	4
Tennessee.....	17	287	115	84	16	14	14	406	7	45
Texas.....	7	776	701	2,330	25	41	7	349	8	149
West Virginia.....	5	222	113	—	48	—	3	580	3	26

November 1935		Cases		Cases	
Actinomycosis:		Impetigo contagiosa:		Tetanus:	
Illinois	1	Illinois	9	Alabama	7
Anthrax:		Kansas	3	Illinois	2
Illinois	1	Maryland	41	Kansas	1
Chicken pox:		Tennessee	23	Maryland	2
Alabama	212	Jaundice, epidemic:		New York	2
Idaho	76	Minnesota	2	Ohio	2
Illinois	1,701	Lead poisoning:		Tennessee	3
Kansas	626	Illinois	2		
Maryland	240	Ohio	4	Trachoma:	
Minnesota	1,026	Pennsylvania	1	Alabama	1
New York	2,148	Mumps:		Illinois	15
North Dakota	178	Alabama	105	Ohio	1
Ohio	1,992	Idaho	50	South Dakota	3
Pennsylvania	3,397	Illinois	382	Tennessee	1
South Dakota	141	Kansas	165		
Tennessee	139	Maryland	57	Trichinosis:	
Texas	77	North Dakota	549	Minnesota	1
West Virginia	270	Ohio	568	New York	22
Dengue:		Pennsylvania	1,068	Pennsylvania	1
Texas	5	South Dakota	66		
Diarrhea and enteritis:		Tennessee	33	Tularaemia:	
Ohio (under 2 years)	10	Texas	401	Illinois	6
Dysentery:		West Virginia	41	Kansas	2
Alabama (amoebic)	2	Ophthalmia neonatorum:		Minnesota	5
Illinois (amoebic)	6	Alabama	1	Ohio	4
Illinois (bacillary)	2	Illinois	3	Tennessee	1
Illinois (amoebic carrier)	19	Maryland	3	Texas	1
Kansas (bacillary)	2	New York	3	Typhus fever:	
Maryland (bacillary)	6	Ohio	67	Alabama	37
Minnesota (amoebic)	2	Pennsylvania	3	New York	3
Minnesota (bacillary)	5	Tennessee	4	Tennessee	3
New York (amoebic)	10	Paratyphoid fever:		Texas	14
New York (bacillary)	46	Illinois	2	Undulant fever:	
Pennsylvania (bacillary)	1	Maryland	1	Alabama	3
Tennessee (amoebic)	2	New York	6	Idaho	1
Tennessee (bacillary)	16	Texas	6	Illinois	6
Texas (amoebic)	3	Puerperal septicaemia:		Kansas	13
Texas (bacillary)	27	Illinois	3	Maryland	5
Epidemic encephalitis:		Ohio	3	Minnesota	9
Alabama	1	Rabies in animals:		New York	11
Illinois	8	Alabama	87	North Dakota	1
Kansas	4	Illinois	17	Ohio	6
Maryland	1	Kansas	6	Pennsylvania	6
Minnesota	1	Maryland	1	Tennessee	2
New York	2	New York	5	West Virginia	1
Pennsylvania	5	Texas	13	Vincent's infection:	
Texas	1	Rabies in man:		Illinois	24
Food poisoning:		Alabama	1	Kansas	8
Kansas	1	Rocky Mountain spotted fever:		Maryland	27
Maryland	14	Pennsylvania	1	New York	62
Ohio	3	Scabies:		North Dakota	6
German measles:		Idaho	1	Tennessee	6
Alabama	1	Kansas	4	Whooping cough:	
Illinois	29	Maryland	1	Alabama	74
Kansas	6	Tennessee	10	Idaho	1
Maryland	28	Septic sore throat:		Illinois	707
New York	137	Idaho	2	Kansas	114
Ohio	10	Illinois	8	Maryland	95
Pennsylvania	183	Kansas	3	Minnesota	143
Tennessee	3	Maryland	25	New York	1,502
		Minnesota	1	North Dakota	14
		New York	57	Ohio	511
		North Dakota	3	Pennsylvania	1,113
		Ohio	103	South Dakota	9
		Tennessee	61	Tennessee	115
		West Virginia	1	Texas	100
				West Virginia	70

¹ Exclusive of New York City.

WEEKLY REPORTS FROM CITIES

City reports for week ended Dec. 14, 1935

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Small-pox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	1	0	0	3	0	0	0	0	24	20
New Hampshire:											
Concord	0		1	0	2	0	0	0	0	1	13
Manchester	0		2	0	1	4	0	0	0	0	16
Nashua	0			0		0	0		0	0	
Vermont:											
Barre											
Burlington	0		0	0	0	0	0	0	1	0	2
Rutland	0		0	0	2	1	0	0	0	0	10
Massachusetts:											
Boston	0		1	43	26	64	0	11	0	11	236
Fall River	2		0	1	7	2	0	0	0	0	28
Springfield	0		0	0	2	3	0	0	0	11	35
Worcester	0		0	1	7	25	0	4	0	2	50
Rhode Island:											
Pawtucket											
Providence	0		0	1	5	14	0	1	0	5	60
Connecticut:											
Bridgeport	4	1	0	0	0	7	0	0	0	3	37
Hartford	0		0	1	8	4	0	0	0	16	51
New Haven	0		0	0	2	0	0	0	0	10	46
New York:											
Buffalo	0		0	15	18	54	0	8	0	5	147
New York	36	19	6	114	116	170	0	72	10	105	1,471
Rochester	2	1	0	0	1	5	0	5	2	4	64
Syracuse	0		0	0	4	7	0	0	0	26	36
New Jersey:											
Camden	1		0	0	2	2	0	0	0	0	47
Newark	1	6	1	0	14	30	0	4	0	37	109
Trenton	0		1	0	2	8	0	2	0	1	37
Pennsylvania:											
Philadelphia	1	3	3	72	37	95	0	18	2	106	496
Pittsburgh	5	1	1	27	32	90	0	6	0	14	197
Reading	0		0	1	2	2	0	2	0	0	38
Scranton	0			3	0	8			0		
Ohio:											
Cincinnati	6		2	5	10	14	0	8	0	1	143
Cleveland	0	46	3	6	20	28	0	11	0	44	182
Columbus	3		0	0	8	25	0	4	1	0	103
Toledo	0	2	2	8	7	5	0	4	0	8	74
Indiana:											
Anderson	2		0	0	1	0	0	1	0	3	13
Fort Wayne	4		0	0	4	10	6	2	0	0	27
Indianapolis	6		0	1	26	32	0	3	5	28	115
Muncie	0		0	0	2	0	0	0	0	0	11
South Bend	0		1	1	0	3	0	0	0	0	19
Terre Haute	0		0	0	0	0	0	0	0	0	35
Illinois:											
Alton	10		1	1	0	4	0	0	0	0	7
Chicago	10	11	6	12	58	242	0	39	0	138	734
Elgin	0		0	1	1	0	0	1	0	0	11
Moline	0		0	0	0	0	0	0	0	0	9
Springfield	0	1	0	2	1	2	0	1	0	0	21
Michigan:											
Detroit	15	6	1	5	30	84	0	13	1	134	272
Flint	2		0	2	3	19	0	1	0	18	31
Grand Rapids	0		1	1	0	17	0	1	0	9	41
Wisconsin:											
Kenosha	0		0	2	1	0	0	0	0	0	6
Milwaukee	0	1	1	5	6	0	0	3	0	98	106
Racine	0		0	4	0	14	0	0	0	5	16
Superior	0		0	0	0	7	0	0	0	0	11
Minnesota:											
Duluth	0		0	0	2	1	0	2	0	3	32
Minneapolis	5		0	18	7	128	0	3	0	11	111
St. Paul	0		0	1	4	39	0	3	0	4	61
Iowa:											
Cedar Rapids	0			1	0	6	0		0	0	
Davenport	0			0		4	0		0	0	
Des Moines	0			0		5	0		0	1	37
Sioux City	1			0		12	0		0	1	
Waterloo	4			0		3	0		0	0	

City reports for week ended Dec. 14, 1935—Continued

State and city	Diph- theria cases	Influenza		Mea- sles cases	Pneu- monia deaths	Scarlet fever cases	Small- pox cases	Tuber- culosis deaths	Ty- phoid fever cases	Whoop- ing cough cases	Deaths, all causes
		Cases	Deaths								
Missouri:											
Kansas City.....	2	2	1	1	7	15	0	8	0	1	109
St. Joseph.....	8		0	0	11	3	0	2	0	1	45
St. Louis.....	22		1	1	19	47	0	7	0	7	236
North Dakota:											
Fargo.....	0		0	0	2	7	0	0	0	0	11
Grand Forks.....	0		0	0		0	0	0	0	0	
Minot.....	0		0	1	0	2	0	0	0	0	4
South Dakota:											
Aberdeen.....	0			0		0	0		0	0	
Nebraska:											
Omaha.....	7		0	4	6	158	9	3	0	0	67
Kansas:											
Lawrence.....	0		0	0	0	0	0	0	0	0	5
Topeka.....	0		0	0	5	9	0	0	0	0	18
Wichita.....	0		0	2	1	12	0	1	0	0	30
Delaware:											
Wilmington.....	0		0	1	4	1	0	3	0	4	37
Maryland:											
Baltimore.....	7	1	0	1	21	29	0	17	2	16	224
Cumberland.....	6		0	0	0	1	0	0	0	0	20
Frederick.....	0		0	0	1	0	0	0	0	0	7
District of Colum- bia:											
Washington.....	33		0	3	22	19	0	15	6	5	157
Virginia:											
Lynchburg.....	3		0	0	3	3	0	1	0	4	14
Norfolk.....	0		0	0	4	5	0	1	0	2	32
Richmond.....	0		0	0	6	8	0	2	0	0	58
Roanoke.....	3		0	0	0	2	0	1	0	0	18
West Virginia:											
Charleston.....	5		0	0	2	2	0	0	0	0	17
Huntington.....	1			0		2	0		0	0	
Wheeling.....	0		0	0	1	0	0	0	0	0	21
North Carolina:											
Raleigh.....	0		0	0	1	0	0	0	0	0	14
Wilmington.....	0		0	1	1	0	0	1	0	1	14
Winston-Salem.....	0	1	0	1	3	6	0	0	0	0	16
South Carolina:											
Charleston.....	2	14	0	0	0	3	0	0	0	1	14
Florence.....	0		0	0	0	0	0	0	0	0	7
Greenville.....	0		0	0	2	1	0	0	0	2	9
Georgia:											
Atlanta.....	8	48	0	1	14	21	0	0	2	0	103
Brunswick.....	0		0	0	0	0	0	0	0	0	6
Savannah.....	0	13	4	0	5	3	0	1	0	0	39
Florida:											
Miami.....	1	2	0	0	1	2	0	2	0	0	38
Tampa.....	1	1	1	0	1	2	0	1	1	0	27
Kentucky:											
Ashland.....	2			0		0	0		0	0	
Covington.....	2		0	0	4	3	0	0	0	0	0
Lexington.....	1		0	0	3	2	0	2	0	0	24
Tennessee:											
Knoxville.....	6		0	0	0	4	0	1	0	0	19
Memphis.....	6		1	0	12	8	0	5	0	5	91
Nashville.....	3		3	1	7	1	0	1	1	0	59
Alabama:											
Birmingham.....	1	5	1	0	12	0	0	2	0	0	74
Mobile.....	1	1	1	0	4	2	0	0	0	0	31
Montgomery.....	1			2		2	0		0	0	
Arkansas:											
Fort Smith.....	1		*	0		1	0		0	0	
Little Rock.....	0		0	0	3	6	0	1	0	0	5
Louisiana:											
Lake Charles.....	1		0	0	0	0	0	0	0	0	6
New Orleans.....	10	5	6	7	16	14	0	11	5	0	174
Shreveport.....	0		0	0	11	3	0	1	2	0	41
Texas:											
Dallas.....	6	2	2	0	9	4	0	1	0	4	49
Fort Worth.....	9		1	2	5	3	0	3	0	5	36
Galveston.....	3		0	0	3	3	0	1	0	0	18
Houston.....	12		1	5	13	2	0	5	0	0	93
San Antonio.....	3		2	0	7	0	0	2	0	0	41

City reports for week ended Dec. 14, 1935—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Small-pox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Montana:											
Billings.....	0		0	3	1	18	0	0	0	0	10
Great Falls.....	0		0	0	1	3	0	0	0	2	11
Helena.....	0		0	0	4	0	0	0	0	0	7
Missoula.....	0		0	0	6	18	0	0	0	0	14
Idaho:											
Boise.....	0		0	0	1	4	0	0	0	0	7
Colorado:											
Colorado Springs.....	0		0	0	1	7	0	2	0	5	17
Denver.....	0		0	0	3	20	0	0	0	1	9
Pueblo.....	0		0	0	3	20	0	0	0	1	9
New Mexico:											
Albuquerque.....	1	2	2	0	3	12	0	2	0	4	20
Utah:											
Salt Lake City.....	0		0	4	4	60	0	2	0	0	42
Nevada:											
Reno.....											
Washington:											
Seattle.....	0		1	7	3	26	0	5	0	6	89
Spokane.....	0	1	1	8	2	0	2	0	0	0	30
Tacoma.....	0		0	1	3	4	0	1	0	1	25
Oregon:											
Portland.....	0	1		43	9	16	0	0	1	1	87
Salem.....	0			0		2	0		1	1	
California:											
Los Angeles.....	10	20	5	28	25	73	0	11	1	19	323
Sacramento.....	2		0	1	2	27	0	1	0	8	30
San Francisco.....	1		0	43	8	29	0	7	0	26	167

State and city	Meningococcus meningitis		Polio-myelitis cases	State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths			Cases	Deaths	
Maine:				Missouri:			
Portland.....	0	0	2	Kansas City.....	0	0	1
Massachusetts:				St. Joseph.....	2	0	0
Boston.....	1	1	5	St. Louis.....	1	0	0
Springfield.....	1	1	0	Nebraska:			
Worcester.....	1	1	0	Omaha.....	1	0	0
Connecticut:				Maryland:			
Bridgeport.....	0	1	0	Baltimore.....	3	0	0
New York:				District of Columbia:			
New York.....	5	3	2	Washington.....	3	1	0
New Jersey:				West Virginia:			
Camden.....	0	0	1	Wheeling.....	0	1	0
Pennsylvania:				South Carolina:			
Philadelphia.....	1	2	3	Charleston.....	2	1	0
Pittsburgh.....	1	0	0	Tennessee:			
Ohio:				Knoxville.....	0	1	0
Cincinnati.....	1	0	0	Alabama:			
Cleveland.....	1	0	0	Birmingham.....	2	0	0
Toledo.....	0	1	0	Mobile.....	0	1	0
Indiana:				Louisiana:			
Indianapolis.....	1	1	0	New Orleans.....	2	1	0
Illinois:				Texas:			
Chicago.....	4	2	2	Galveston.....	2	0	0
Springfield.....	2	1	0	Colorado:			
Michigan:				Colorado Springs.....	1	1	0
Detroit.....	3	0	0	Washington:			
Wisconsin:				Seattle.....	1	0	0
Kenosha.....	1	1	0	California:			
Minnesota:				Los Angeles.....	3	2	1
Minneapolis.....	0	1	0	San Francisco.....	1	0	0
Iowa:				Oregon:			
Cedar Rapids.....	0	0	1	Portland.....	2	0	2

Epidemic encephalitis.—Cases: Detroit, 2; Fargo, 1.

Pellagra.—Cases: Cincinnati, 1; Winston-Salem, 1; Charleston, S. C., 1; Atlanta, 1; Miami, 1; New Orleans, 2; San Francisco, 1.

Typhus fever.—Cases: Charleston, S. C., 1; Savannah, 1; Lake Charles, 1.

FOREIGN AND INSULAR

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for December 27, 1935, pages 1834-1848. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued January 31, 1936, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Plague

India—Bassein.—During the week ended December 14, 1935, 1 fatal case of plague was reported in Bassein, India.

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